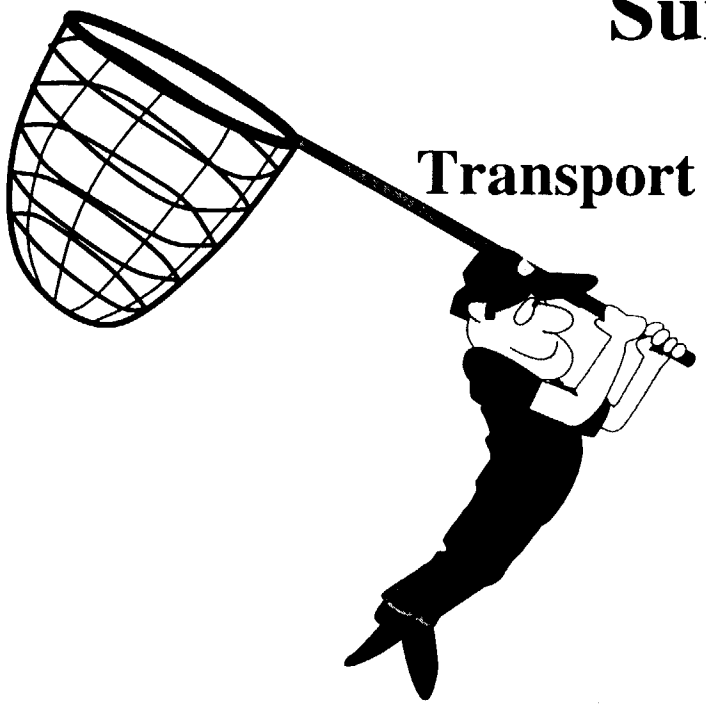
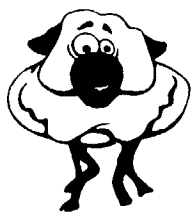
Design for Security HWG

Summary Update

Transport Airplane and Engine Issues Group

Seattle, Washington





Mark Allen - Chair
Boeing - Structures

Sept 11, 2001

Handout 12

ARAC Members

Mark Allen - Chair
Boeing - Structures

Joel Siqueira
Embraer - Design

Jeff Gardlin
FAA - Cabin Safety & Airframe

Dave Melberg
Boeing - Flight Deck

Gale Meek
Cessna - Certification

Steve Loukusa
Boeing - ECS

Captain Peter Reiss
IFALPA / ALPA

Ed Kittel
FAA - Explosives

Michael Purwins
EADS Airbus - Certification

Brian Wall
IATA - Security Services

Rory Martin
JAA / CAA - Structures

Keith Ayre
Bombardier - Systems

Maurizio Molinari
Transport Canada
Structures Engineering

Eric Duvivier
JAA / DGAC
Cabin Safety & ECS

General

Working Group Tasked With Eight ICAO Rules:
(*And One FAA Initiated Rule*)

* Flight Deck Smoke Protection
* Cabin Smoke Extraction
* Cargo Compartment Fire Suppression
* Systems Survivability
* Least Risk Bomb Location (Identification)
* Least Risk Bomb Location (Design)
* Design for Interior Search
* Penetration Resistance
* ***Flight Deck Intrusion - June 11, 2001 Federal Register***

Flight-Deck Smoke Protection

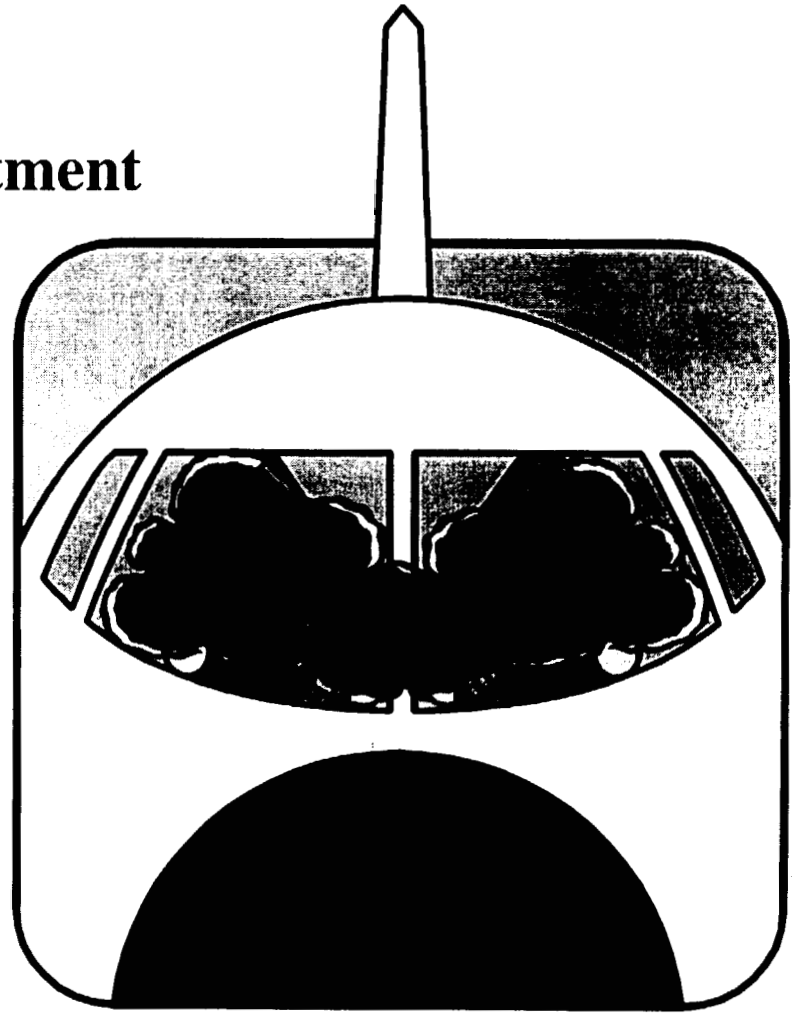
Smoke Entry From any Compartment and any Flight Condition

No System Damage Assumed

Switch-Activated Airflow Boost
(TBD by FAA) Initial Smoke Entry Allowed

MMEL Requirement ???

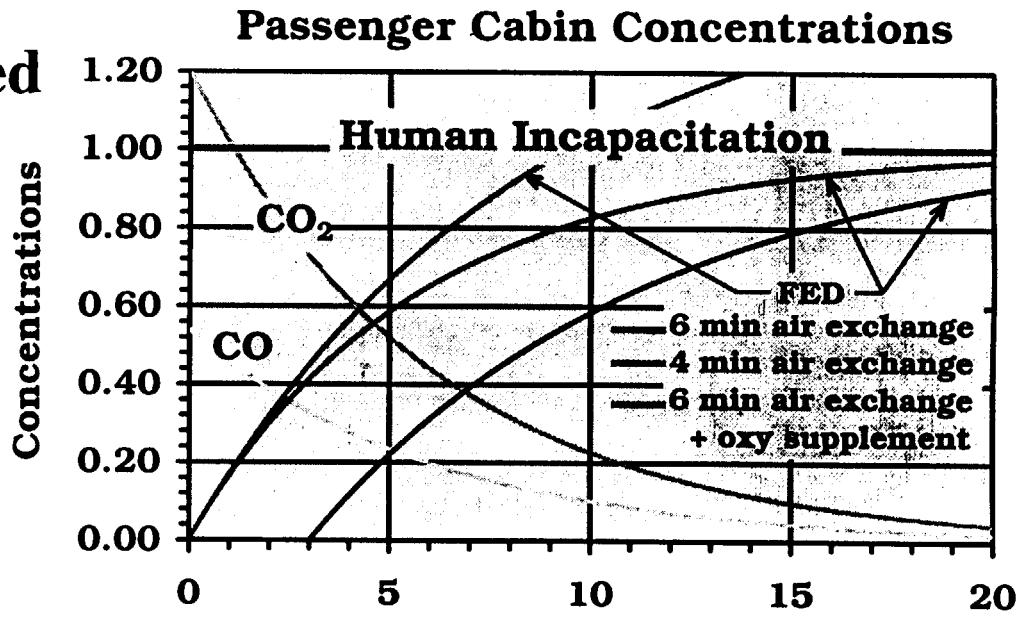
No Recirculated air

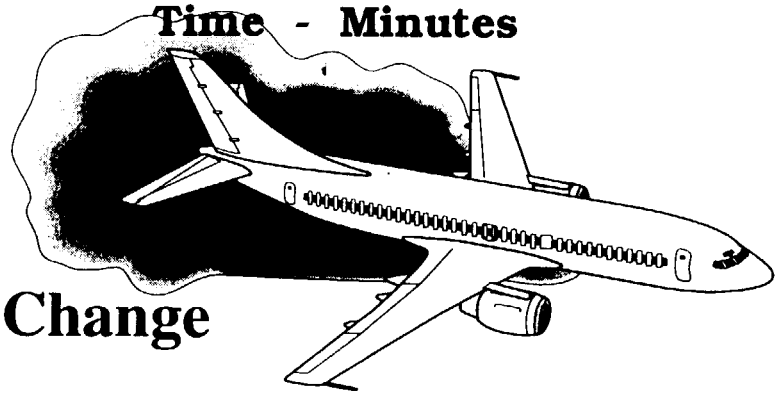


No Airflow Reduction to Passenger Compartment???

Cabin Smoke Extraction

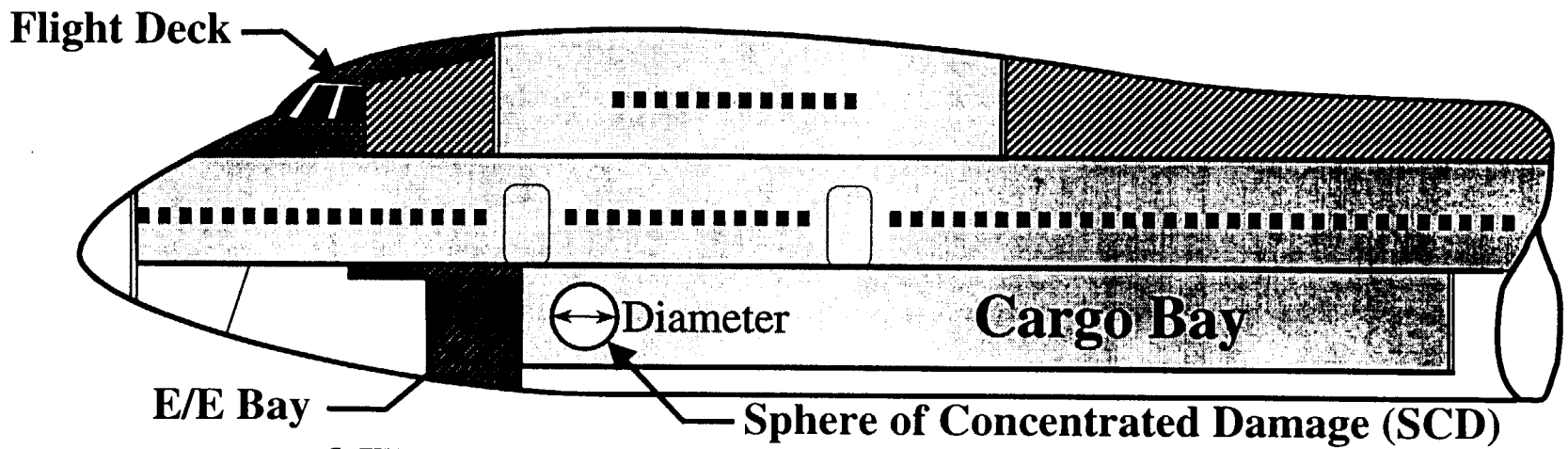
- Smoke Quantity Undefined
- Depressurization not Effective
- Air Pack MMEL???
- CO / CO_2 Ventilation Model
- Human Tolerance Related to Fractional Effective Dose (FED)
- Max Requirement : 4 Min per Air Change
- Supplemental Oxygen Acceptable (Hoods???)





Systems Survivability

Rule Will Resemble FAR 25.365(e) - "20 Square-Foot Hole Rule"
Circular Area Converted to a Spherical Diameter



Full Separation Requirement
- Pressurized - Passenger Inaccessible
- Pressurized - Passenger Accessible

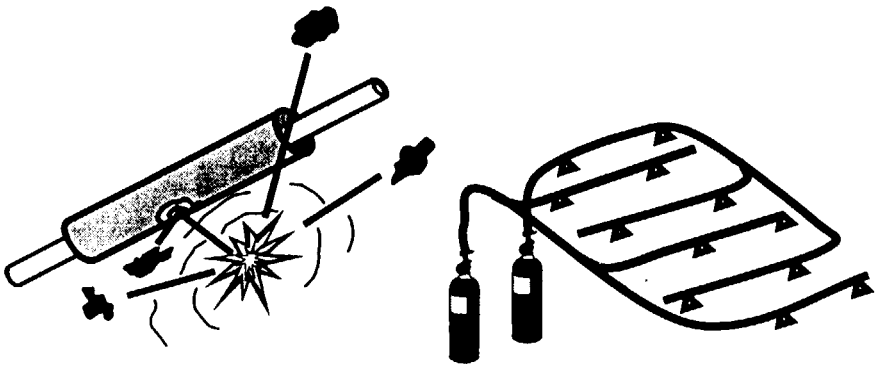
Limited Separation Requirement

SCD Applied Anywhere Within Pressurized Compartment
Some Confined Areas may Have Limited Separation Requirement
SCD Does not Extend Beyond Inner Mold Line (IML)
Systems Protection Undefined if Separation is Unachievable

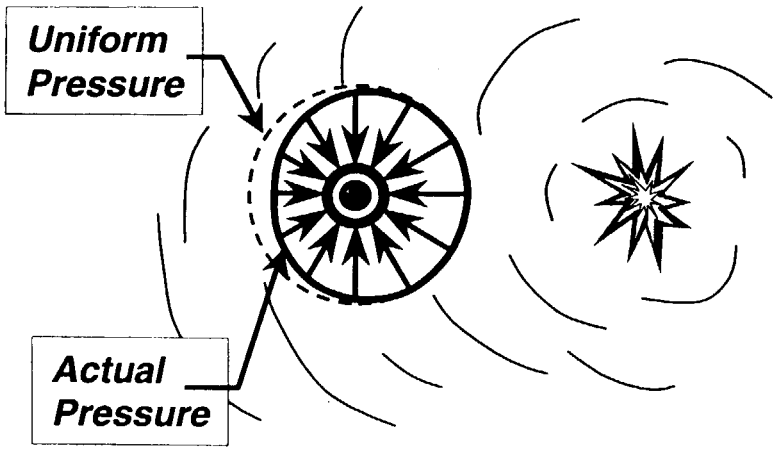
Cargo Compartment Fire Suppression

Fire Detection is Adequate

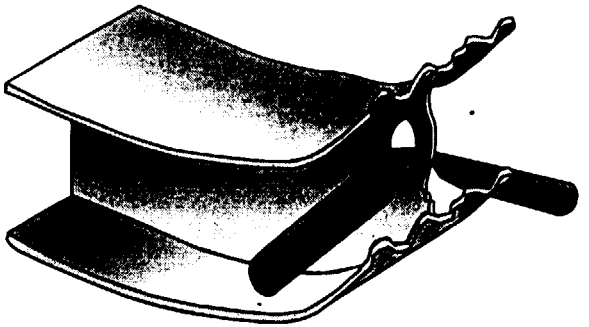
Shielding or Redundancy



Blast Effects Insignificant



Design for Large Deformations

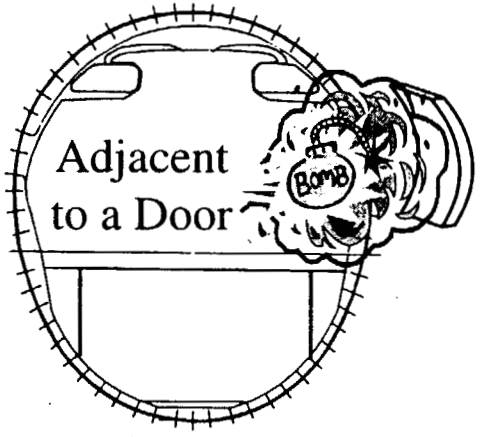


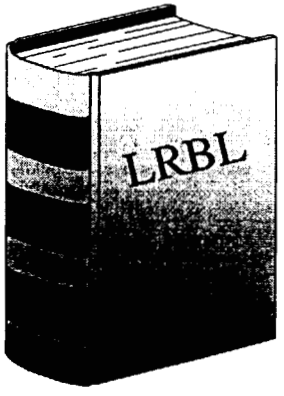
- Several Inch Displacements

Least Risk Bomb Location
(Design & Identification)

- Specific Threat not Identified
- FAA may Specify Damage Size for Other Locations

FAA Preferred Location

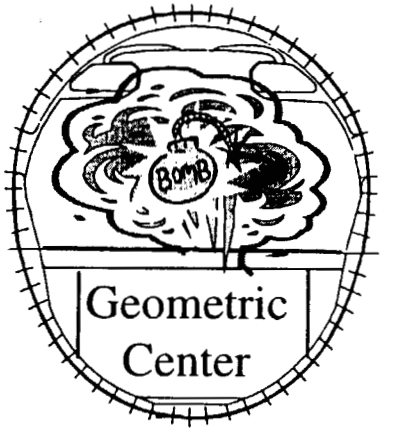




LRBL Procedures

- Manufacturer Creates
- FAA Distributes

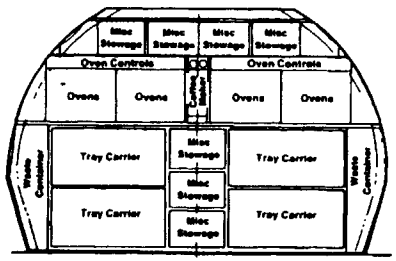
Proposed Alternative (Future Test)



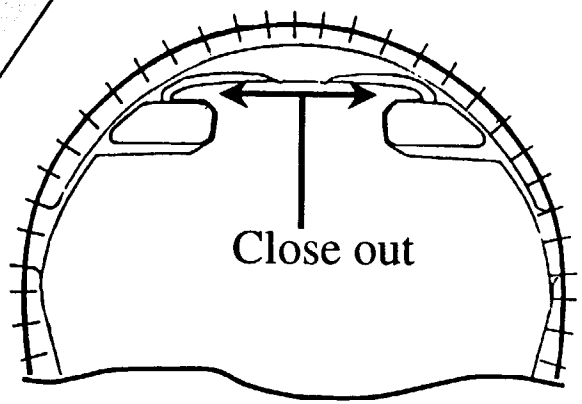
Design for Interior Search

Design for Ease of Inspection and Difficulty for Hiding

Specific Items / Regions Identified for Compliance



- Galleys / Lavatories
- Overhead Bins
- Life Vests
- Seats
- Paneling
- Crew-Rest Areas
- Closets & Lockers
- Flight Deck



Penetration Resistance

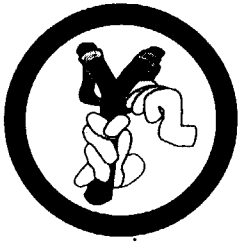
Flight Deck Protection From all Passenger Compartments

No Acceptable Baseline Approved in AC

Protection Follows NIJ Standard 0101.04

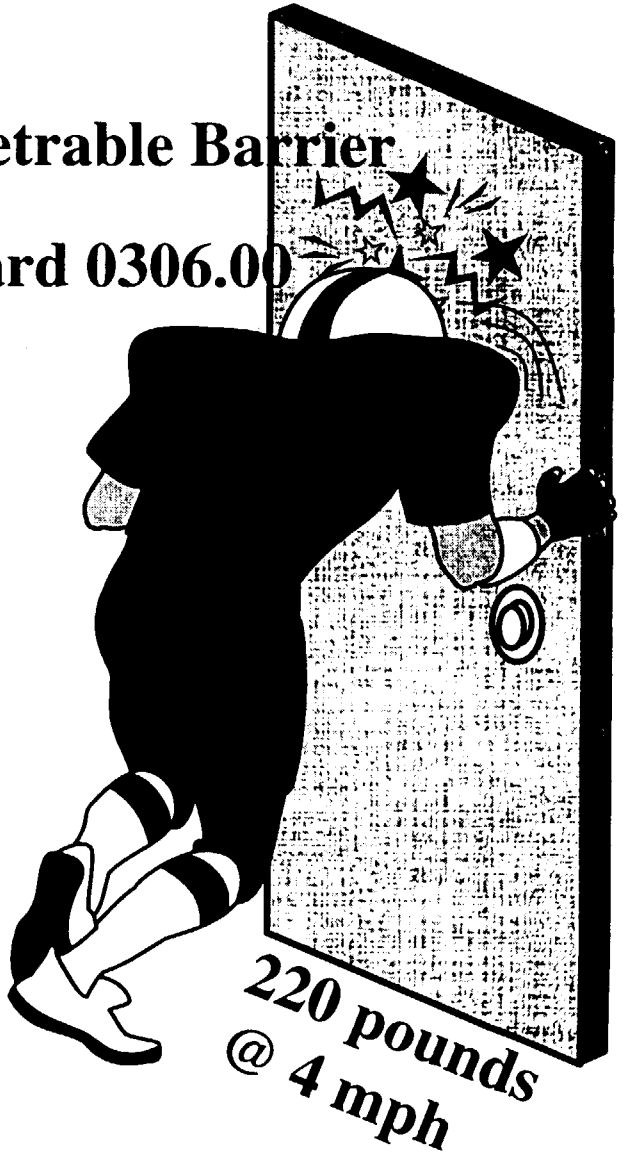
- *.44 Magnum & 9mm @ 1400 fps*
- *Six Shots Each Bullet Type*
- *0° and 30° Impact Angles*
- *No Penetrations Allowed*

Enhanced Designs (by analyses) Need not be Tested



Flight Deck Intrusion

- Design for Entry Delay, not Impenetrable Barrier
- Protection Follows NILECJ Standard 0306.00
  - Medium Door Security
  - Based on Historical Break-Ins
  - Two Impacts Each (160 Joules)
    - Door Center
    - Door Latch
  - 250 lb. Pull on Doorknob
- Blow-out Panels Permitted
- Separate Doors for Each Test



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Meeting Schedule

Paris, France **24 - 26 July 2001**

This is our Last Meeting

Washington D.C. **1 - 4 Oct 2001**